

[This question paper contains 2 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5713

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Unique Paper Code : 2174001201

Name of the Paper : GE : Green Chemistry

Name of the Course : **B.Sc. (H)**

Semester : II/IV/VI/VIII

Duration : 2 Hours

Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **four** questions out of **six**.
3. **All** questions carry equal marks i.e. **15** marks.
4. Attempt all parts of the questions together.

1. (a) Fill in the blanks: (5)

- i) Use of solar energy is covered under the _____ principle of Green Chemistry.
- ii) _____ uses ultrasonic waves to trigger a chemical reaction through acoustic cavitation.
- iii) Flixborough accident was caused due to the chemical _____.
- iv) _____ catalysis is a process in which a chiral catalyst induces the preferential formation of the one enantiomer over the another in a chemical reaction.
- v) Sea-NineTM is a green marine _____ agent.

(b) True / False: (5)

- i) Atom economy of the rearrangement reactions is less than 100%.
- ii) E-Factor is zero for any reaction with no waste.
- iii) "What you don't have can not harm you" is the principle of ISD.
- iv) Solvents obtained from renewable sources are not green solvents.
- v) Asymmetric catalysis aims for >99% e.e.

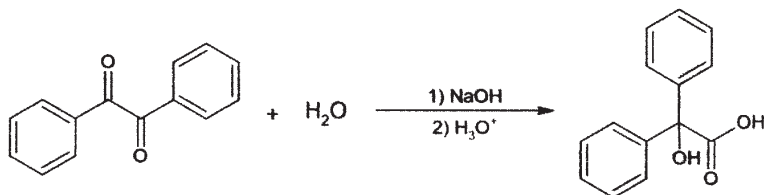
(c) Give the 12 principles of green chemistry. Explain any one with the help of examples. (5)

2. (a) "Green Chemistry is also known as Sustainable Chemistry". Justify your answer with suitable examples. (5)

(b) Discuss the importance of Green Chemistry in daily life, giving examples. (5)

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- (c) What are the green chemistry challenge awards. Discuss its any five categories. (5)
3. (a) What are ionic liquids? Why are these also termed as designer solvents. Give the advantages of ionic liquids. (5)
- (b) Catalytic reagents are superior to stoichiometric reagents. Explain. (5)
- (c) Define Atom economy. Calculate it for the following reaction: (5)



- 4) (a) Match the following: (5)

A	B
i) Water	(a) Enzymes
ii) Biocatalysis	(b) T. Paul Anastas
iii) Bhopal Gas Tragedy	(c) Universal solvent
iv) E-Factor	(d) John C. Warner
v) Father of Green Chemistry	(e) MIC
	(f) Waste

- (b) What is supercritical CO₂? Discuss its advantages and disadvantages as a solvent in place of organic solvent. (5)
- (c) Discuss the concept of green chemistry and sustainability in chemical processes. (5)
- 5) Differentiate between the following: (with suitable examples) (*any three*) (5x3=15)
- Microwave and Conventional heating
 - Homogeneous and Heterogeneous catalysis
 - % Atom Economy and % yield
 - Green Chemistry and Environmental Chemistry
- 6) Write Short Notes on the following: (*any three*) (5x3=15)
- Flixborough accident
 - Rightfit Pigments
 - ISD
 - Biocatalysis